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United States Patent [19]

Koenck

[11] Patent Number: 5,986,435

[45] Date of Patent: *Nov. 16, 1999

41

[54] METHOD OF UTILIZING A BATTERY POWERED SYSTEM HAVING TWO PROCESSORS

[75] Inventor: Steven E. Koenck, Cedar Rapids, Iowa

[73] Assignee: Intermec IP Corp., Woodland Hills, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: 09/205,518

[22] Filed: Dec. 3, 1998

Related U.S. Application Data

[63] Continuation-in-part of application No. 09/082,061, May 20, 1998, Pat. No. 5,889,386, which is a continuation of application No. 08/879,475, Jun. 20, 1997, which is a continuation of application No. 08/561,665, Nov. 22, 1995, abandoned, which is a continuation of application No. 08/134,881, Oct. 12, 1993, Pat. No. 5,508,599, which is a continuation of application No. 07/769,387, Oct. 1, 1991, Pat. No. 5,278,487, which is a continuation of application No. 07/544,230, Jun. 26, 1990, abandoned, which is a division of application No. 07/422,226, Oct. 16, 1989, Pat. No. 4,961,043, which is a division of application No. 07/168,352, Mar. 15, 1988, Pat. No. 4,885,523, which is a continuation-in-part of application No. 06/944,503, Dec. 18, 1986, Pat. No. 4,737,702, which is a continuation-in-part of application No. 06/876,194, Jun. 19, 1986, Pat. No. 4,709,202, which is a division of application No. 06/797,235, Nov. 12, 1985, Pat. No. 4,716,354, which is a continuation-in-part of application No. 06/612,588, May 21, 1994, Pat. No. 4,553,081, which is a continuation-in-part of application No. 06/385,830, Jun. 7, 1982, Pat. No. 4,455,523.

[51] Int. Cl.[6] H02J 7/00

[52] U.S. Cl. 320/136; 324/427

[58] Field of Search 320/136; 324/426, 324/427

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[57] ABSTRACT

In an exemplary embodiment, a battery conditioning system monitors battery conditioning and includes a memory for storing data based thereon; for example, data may be stored representative of available battery capacity as measured during a deep discharge cycle. With a microprocessor monitoring battery operation of a portable unit, a measure of remaining battery capacity can be calculated and displayed. Where the microprocessor and battery conditioning system memory are permanently secured to the battery so as to receive operating power therefrom during storage and handling, the performance of a given battery in actual use can be accurately judged since the battery system can itself maintain a count of accumulated hours of use and other relevant parameters. In the case of a nonportable conditioning system, two-way communication may be established with a memory associated with the portable unit so that the portable unit can transmit to the conditioning system information concerning battery parameters (e.g. rated battery capacity) and/or battery usage (e.g. numbers of shallow discharge and recharge cycles), and after a conditioning operation, the conditioning system can transmit to the portable unit a measured value of battery capacity, for example.

26 Claims, 24 Drawing Sheets